Confinement Feeding, Early Weaning and Drought Management

LLS Workshop Series

2019

Part 1

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NSW GOVERNMENT | Local Land Services

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What is “Confinement” Feeding ?

“Sacrifice” paddocks and/or “Feedlot” systems used for improving

- environmental,
- pasture,
- economic and
- livestock production efficiencies

Developments - with or without consent

- Current NSW legislation requires Local Council and EPA approval for feedlots > 4000 lambs on feed (Designated Developments). Feedlots with 0-4000 head may require a Letter Of Consent and/or a SEE depending on site sensitivity and the LEP
- NSW legislation requires Local Council consent for cattle feedlots of 50 or more head capacity (DA and an SEE or EIS). Cattle feedlots over 1000 head also require an EPA licence to operate.
- The feeding or penning of sheep/cattle for drought or emergency feeding purposes may be allowed without developmental consent or application

Pro's of Confinement Feeding:

- Reduce
  - Stocking rates = preserve topsoil, groundcover and nutrients
  - Livestock energy needs (save 10-15% of daily ME req)
- Maintain/Improve
  - core breeder base
  - perennial pastures
  - pasture response rates after rain
  - bodyweight/condition

Pro's:

- Maintain/Improve
  - Weaner/adult growth rates or FCE
  - Dam and lamb/calf survival
  - Wool quality (POB, SS etc but need to be mindful of dust/mud/soiling and the impact of feed change on SS when released from feedlot)
- Meet market specifications
- Cashflow/Value add
- Animal Welfare

Con's:

- Costly
  - Full production ration
  - Infrastructure costs
- Potential Health Issues including:
  - acidosis, ammonia toxicity, pulpy kidney, pink eye,
  - salmonella, coccidiosis, campylobacter
  - hypocalcaemia, hypomagnesaemia and pregnancy toxaemia
- Water quality and supply critical

Site Selection

Your site should take into account

- Slope
  - 3 to 4% ideal
  - Avoid boggy hollows or drainage lines. Top of slope preferred
- Soil type
  - medium clay loams preferred
  - Be mindful of erosion and groundwater infiltration (light, sandy soils) and of issues re 'pugging', odour and access when it rains if based on heavy clay soils
- Distance to water courses, neighbours etc
  - Odour, noise, dust, flies etc concerns
  - Target a minimum of 500m

Site Selection

- Water quality and supply
- Distance to yards/storage etc
- Shelter and
- Shade

General

Prior to and during induction/time in confinement

- Imprint lambs/calves
- Vaccinate (5 or 6 in 1, ADE)
- Drench with effective drench
- Feed a balanced ration with adequate energy/protein/vitamins/minerals and fibre
- Provide enough space (trough and area per head) and quality water
- Minimise Stress

Mob Sizes

General recommendation:

- Lambs maximum of 350
- Ewes etc upwards of 500. Larger numbers are possible but riskier
- Calves < 50 if possible
- Cows etc 100-200

Area – Sheep/Cattle

Suggested minimum stocking densities

- Sheep or lambs 5m²
- Weaners 9-10 m²
- Yearlings 12-14m²
- Cows 15-25 m²
- Ewes and lambs 100m²+
- Cows/calves 100 m²+

(small paddocks preferred)

Area

Increasing area/animal may

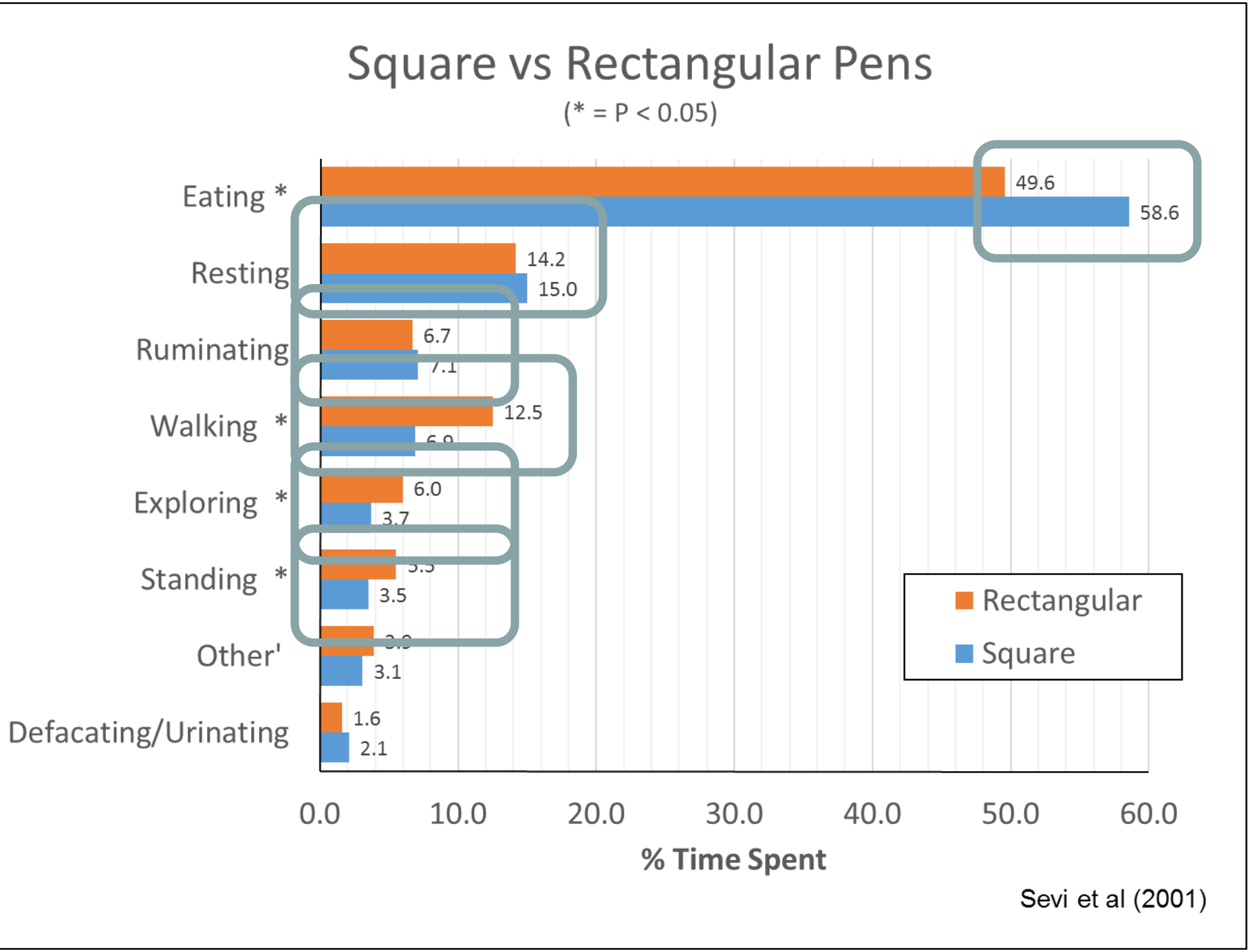
- improve feed intake and FCE
- reduce shy feeder number provided adequate trough space per animal

Reducing area/animal may

- reduce dust on heavier soils but may also increase health/disease issues
- Increase stress/shy feeders

Pen Design

Findings from a grazing trial (Sevi et al 2001; 10m²/ewe) suggest that square pens may be better than rectangular in terms of actions that impact on production


Square vs Rectangular Pens
(* = P < 0.05)
Eating *
Resting
Ruminating
Walking *
Exploring *
Standing *
Other'
Defacating/Urinating
49.6
58.6
14.2
15.0
6.7
12.5
6.0
3.7
3.5
3.1
1.6
2.1
Rectangular
Square
0.0
10.0
20.0
30.0
40.0
50.0
60.0
% Time Spent
Sevi et al (2001)

Feedlot Design

Design will depend on:

- Area available
- Numbers per pen and pen number
- Capital input
- Labour and equipment

Pen design and layout should:

- minimize water contamination
- maximize trough allocation and
- minimize stress

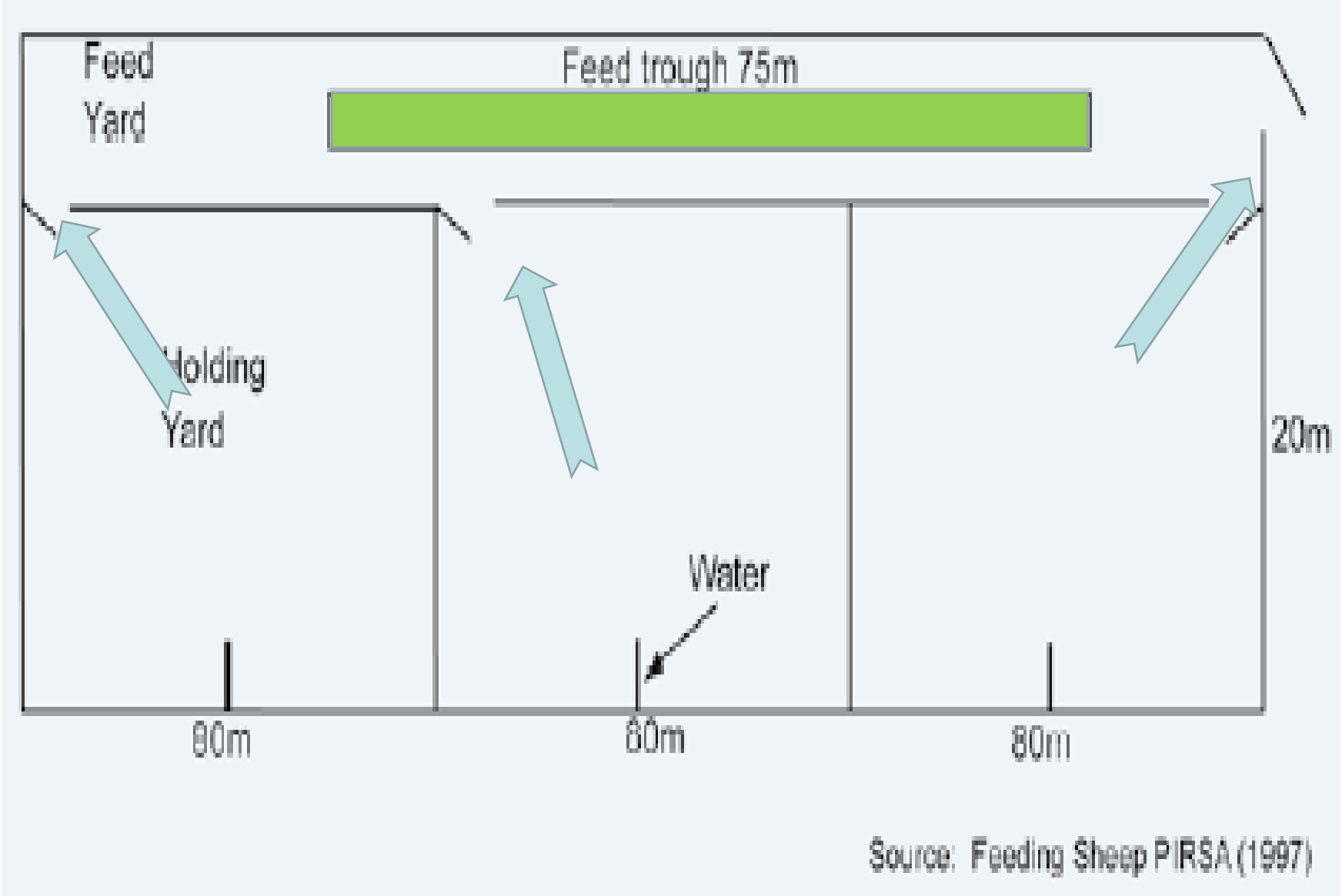
Keep it simple:

Confinement areas do not need to be costly to be functional !!

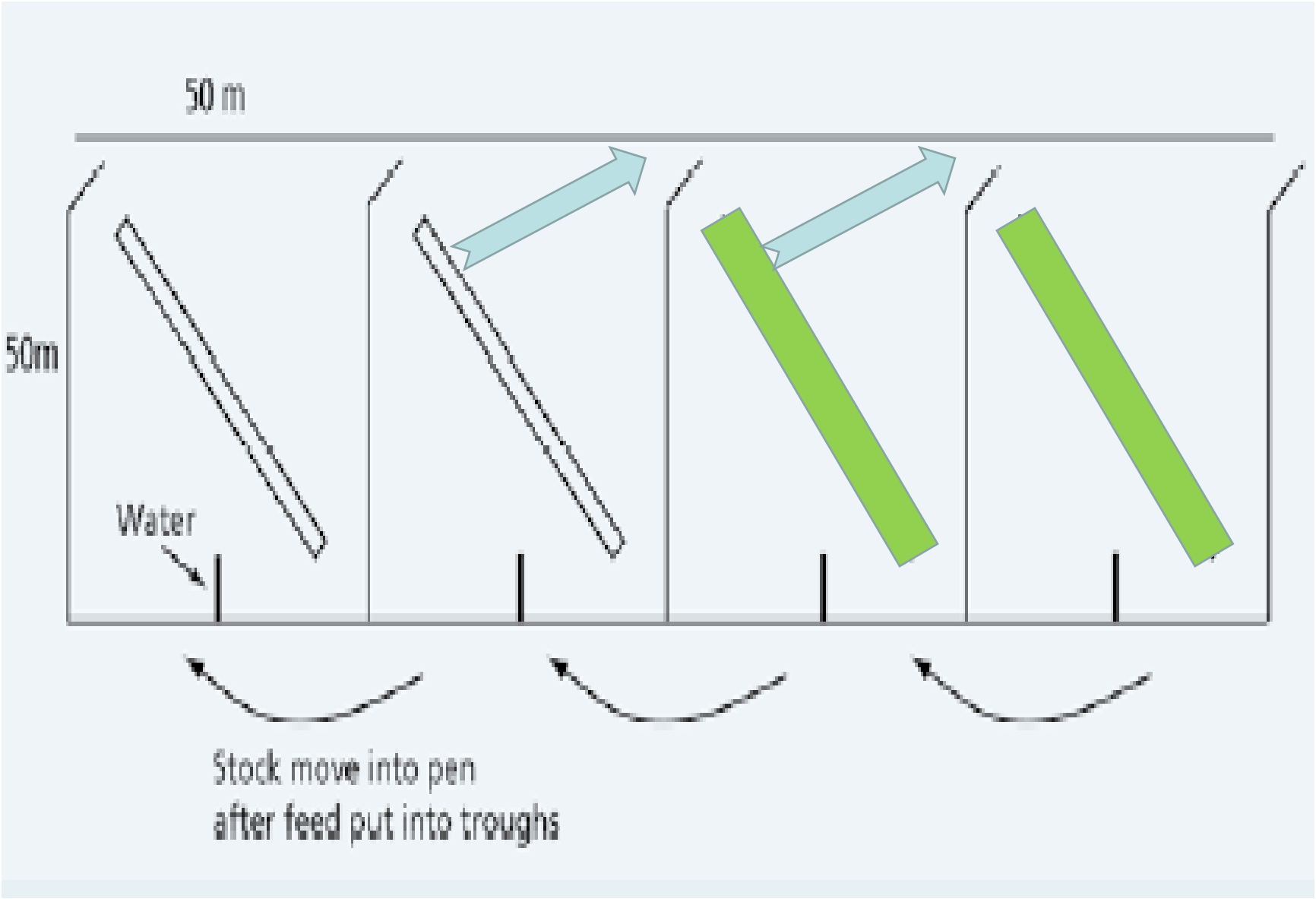
If possible use what you have on-farm


Open
Trough
Pen Designs

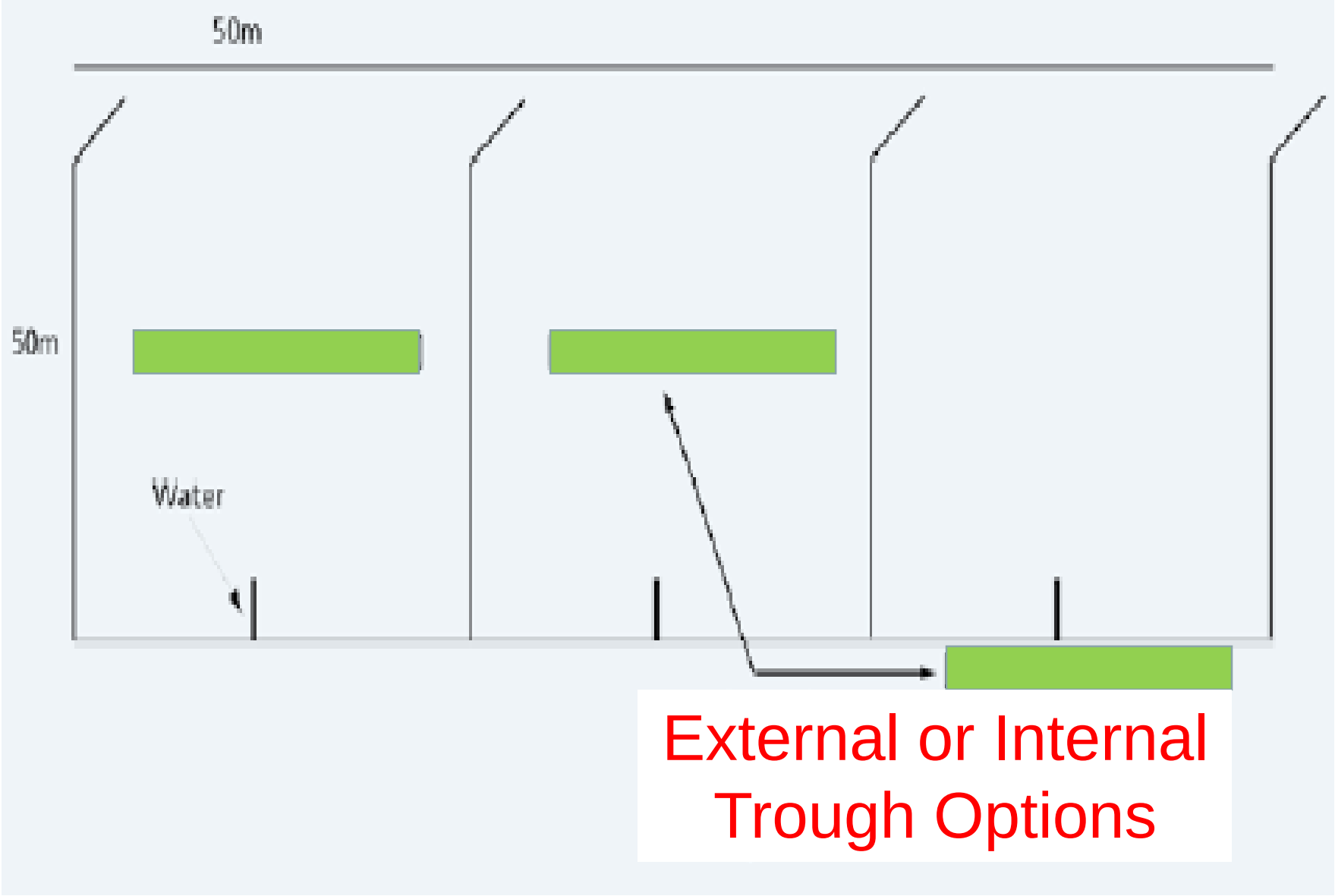
Separate Feeding Yard



Pen Rotation System



Individual Yards



Trough and Self-Feeder Space Recommendations (**Sheep**)

Troughs

- single side access 30+ cm
- double side access 15+ cm

Self-feeders

3 to 5cm/hd (~110 per 2.4m feeder if confined)

Trough and Self-Feeder Space Recommendations (**Cattle**)

Troughs

Weaners	30+ cm
Yearlings	40+ cm
Adult cattle	60+ cm
Horned animals	50+ cm

Self-Feeders

5 to 7 cm/hd (~70/100 per 2.4m feeder)

Open Troughs

Recommendations:

- Feed early morning
- If feeding cereal grain every 2nd or 3rd day be wary of acidosis risk
- Acidosis risk can be reduced by
  - feeding roughage on day prior to feeding grain
  - feeding roughage ad lib
  - using an effective buffer

Trail Feeding vs Troughing

Advantages

- No cost
- Can deliver grain over a greater distance

Disadvantages

- Grain waste may be 15-20%
- Accidental deaths if internal feed
- Increased likelihood of health problems
  (Salmonellosis, Coccidiosis, Campylobacter, Sand Impaction, Pneumonia and Pinkeye)

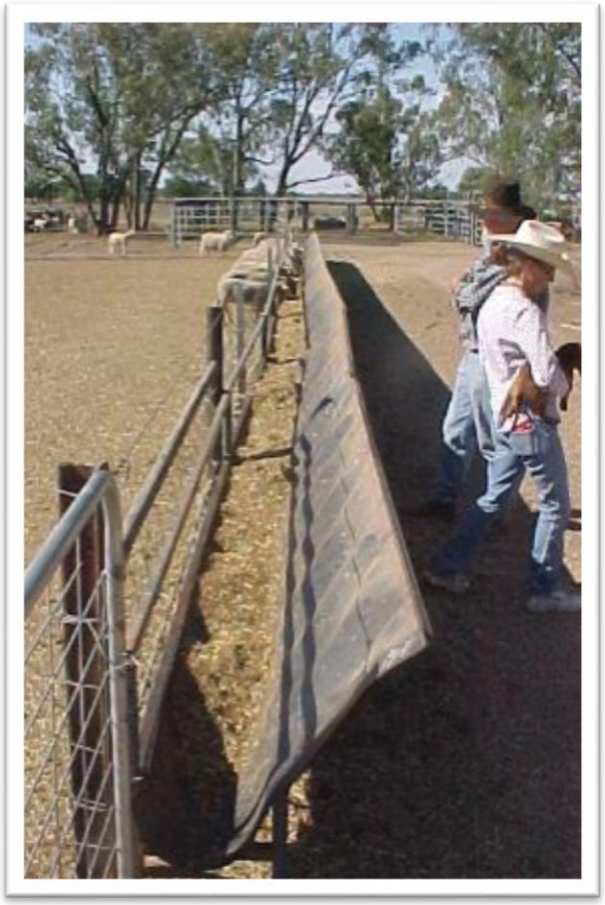
Open Troughs

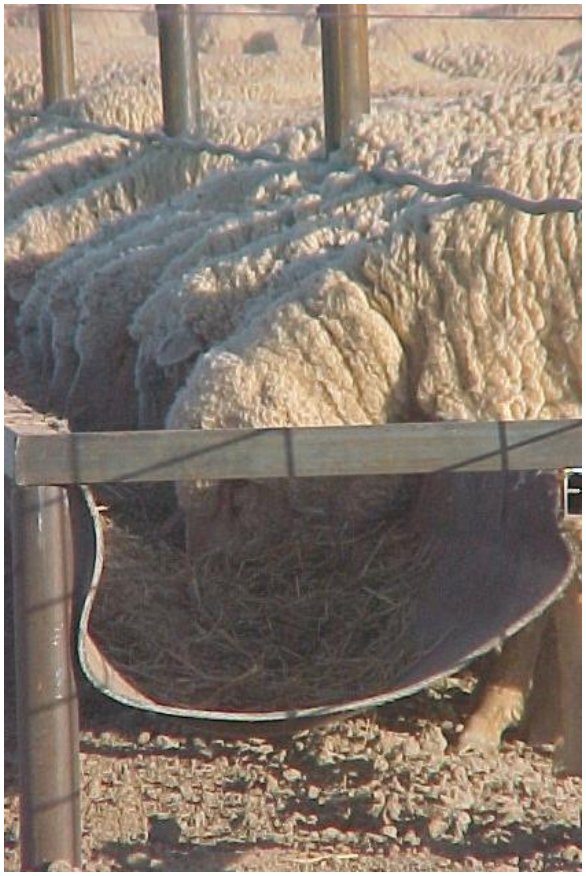
Central vs fenceline trough location

- 80% of the sheep began eating by Day 2 with central troughs vs Day 7 for fenceline troughs
- 78% of sheep eating daily compared with 67% for fenceline troughing

Barnes et al (2008) MLA/Livecorp Review


Open
Trough
Systems





Conveyor belting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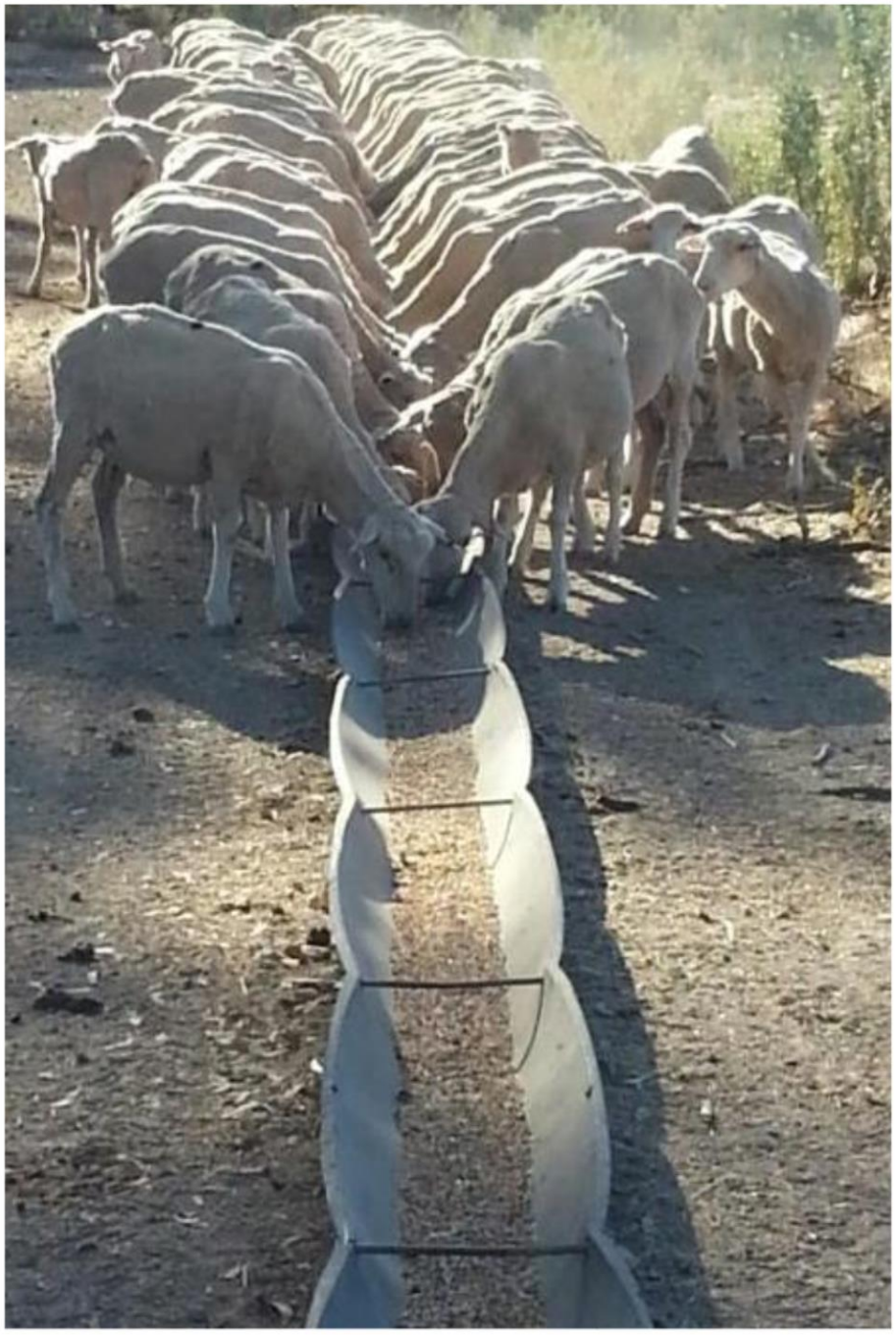
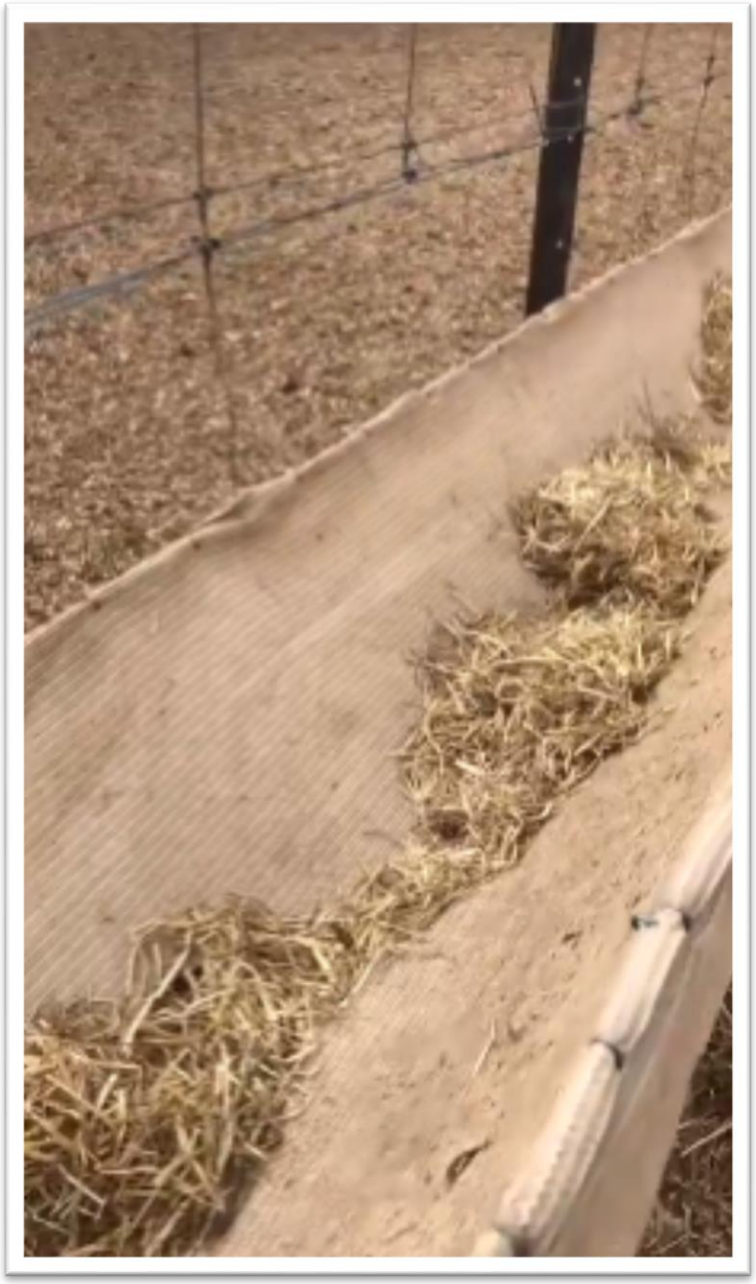
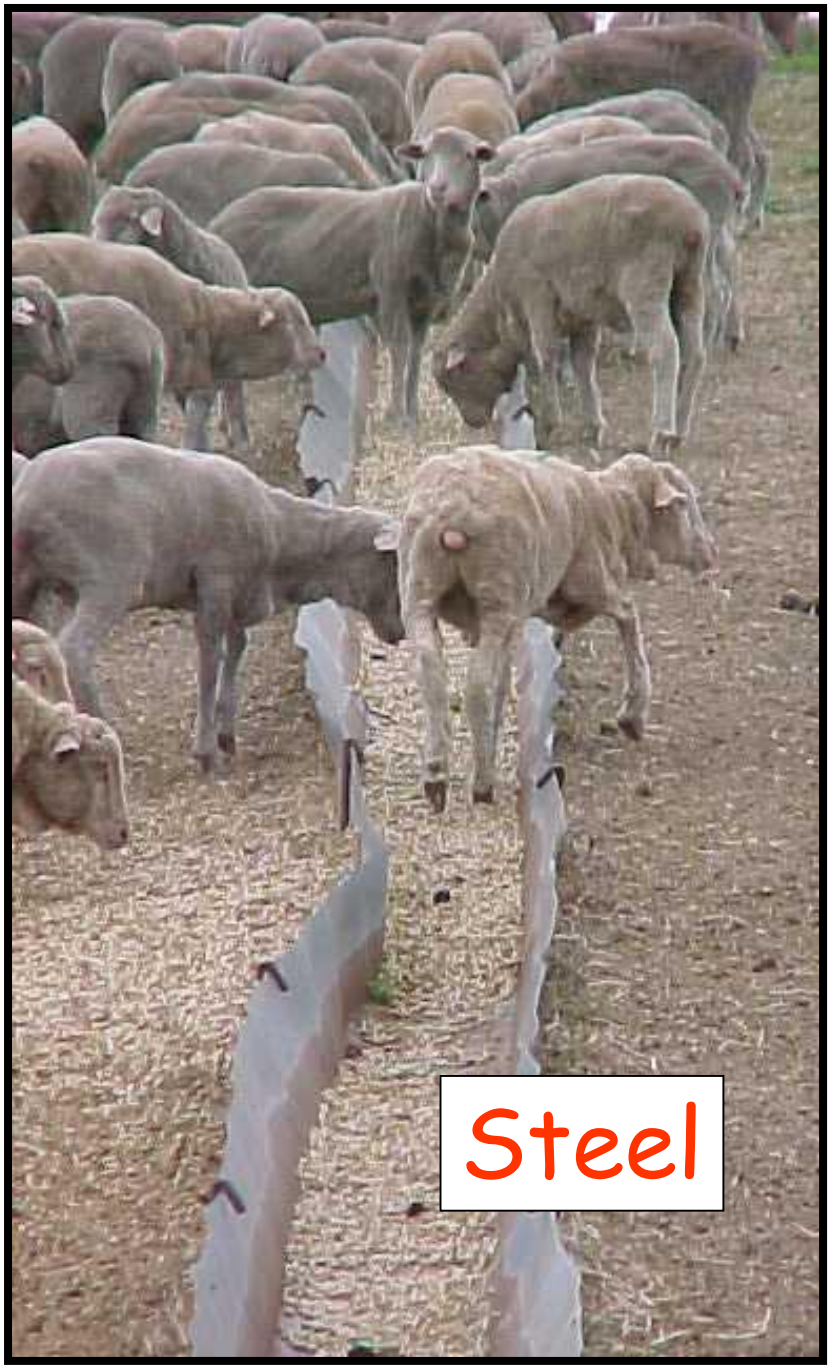


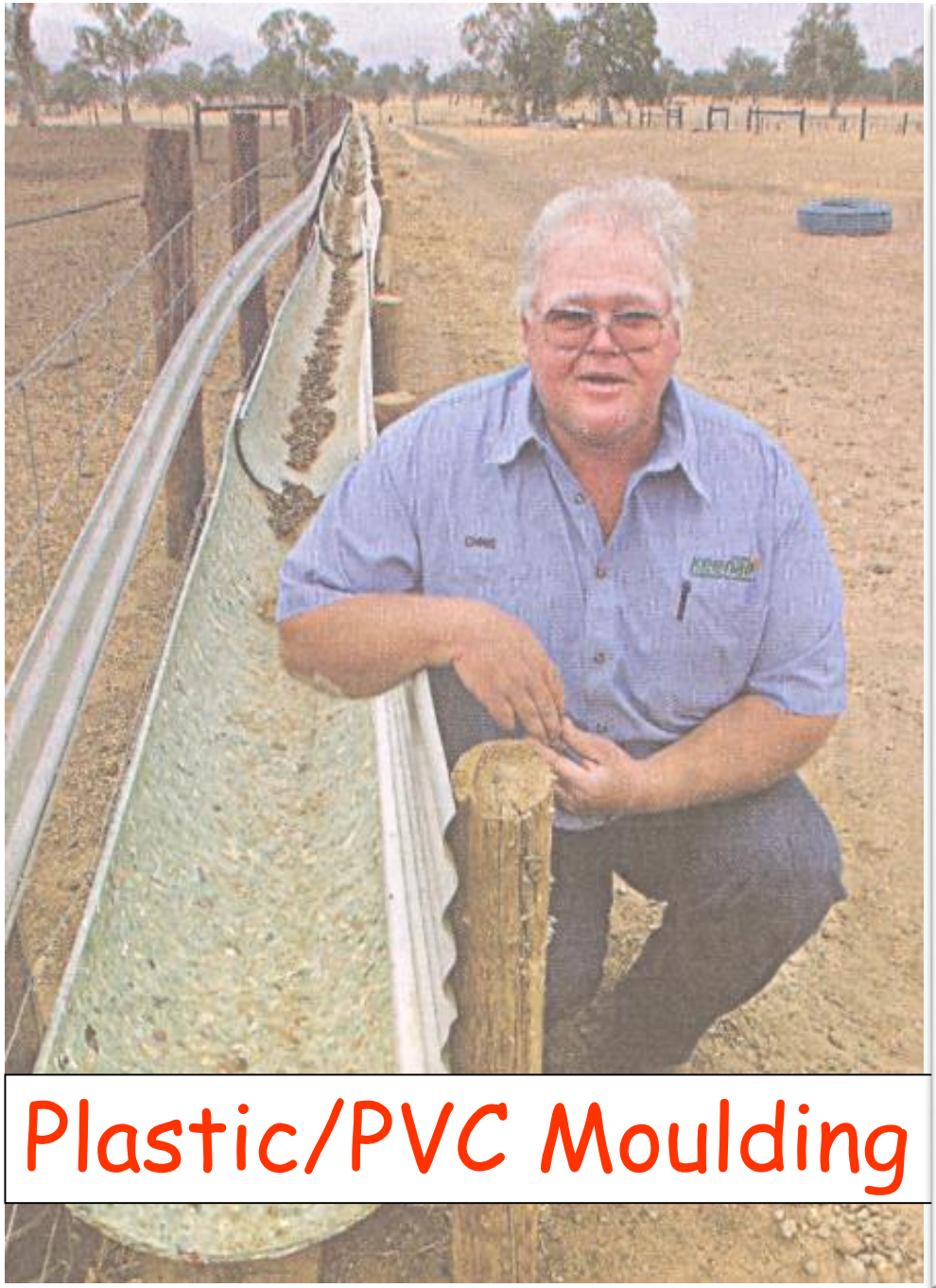
Poly belt



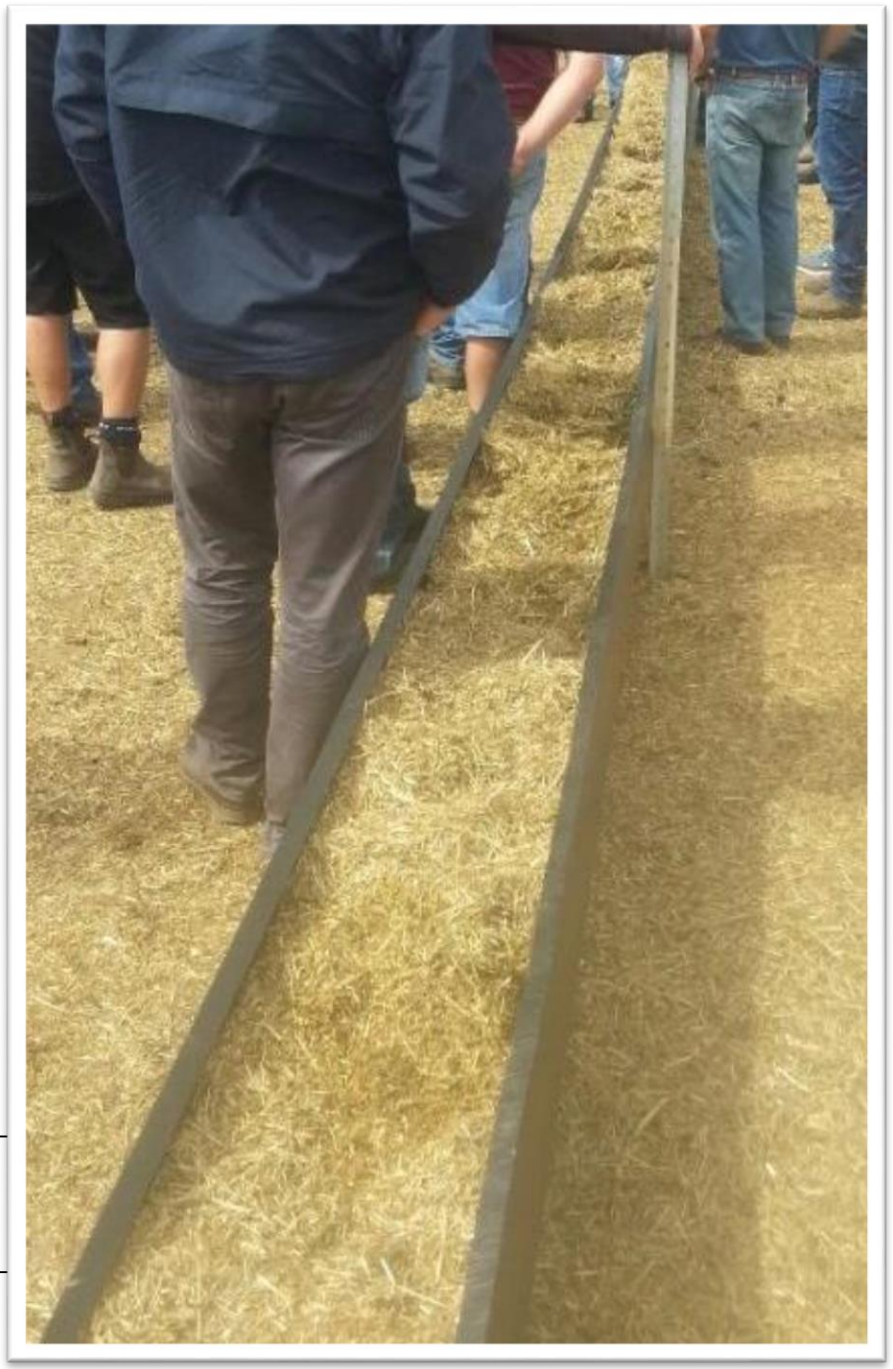

Shade Cloth


Steel


Tyres



Plastic/PVC Moulding



Self Feeders

Advantages

- Feed always available
- Reduces labour
- Greater intake, weight gain and FCE

Disadvantages

- Difficulties changing grains or ration mix
- Expensive
- Issues feeding Total Mix Rations
- Stock may substitute roughage for grain

Feeders / Troughs

- Lift troughs (45-55cm)
- Keep clean and dry
- Position up slope and throughout site
- Block off access under feeders, particularly if feeding during lambing

Alternative Self Feeders

Lick Style

Source: Rob Sutherland

Cereal Grains

No benefit cracking/processing grains for sheep but there are for cattle

Whole grain (when feeding sheep)

- increases intake (by 25%)
- increases growth rates (20%)
- improves feed conversion efficiency (10%)
- reduces acidosis risk

Wheat
Triticale

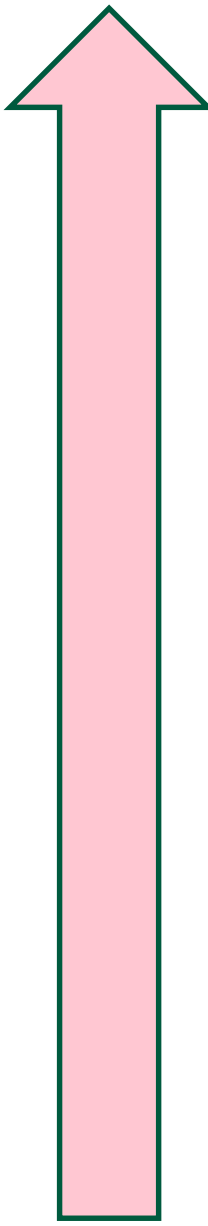
Corn
Sorghum

Barley
Peas and Beans
Cottonseed
Oats
Lupins

Higher in starch
Lower in Fibre

Lower in starch
Higher in Fibre
Higher in Oil

Acidosis
Risk



Minimum energy and protein requirements

Production State	Crude Protein CP %	Metabolisable Energy (ME) MJ/kg
Survival	7	8
Lactation and late pregnancy	12+	12+
Growth	12+	10+
Finishing (depending on age)	12 – 15	11 – 12

Metabolisable Energy (ME)

- Most important indicator of feed quality
- Energy in feed is used for
  - muscle development,
  - fat storage,
  - maintenance and
  - growth
- Measured in megajoules of energy per kg of feed dry matter (MJ ME/kg DM)

Energy (Mj ME/kg DM)

Carbohydrates	15-18 Mj/kg DM
Protein	22-24
Oil	36-40

Excess protein can be used
as an energy source.
Oil is a high energy element but there are limitations – no more than 7-8% in ration

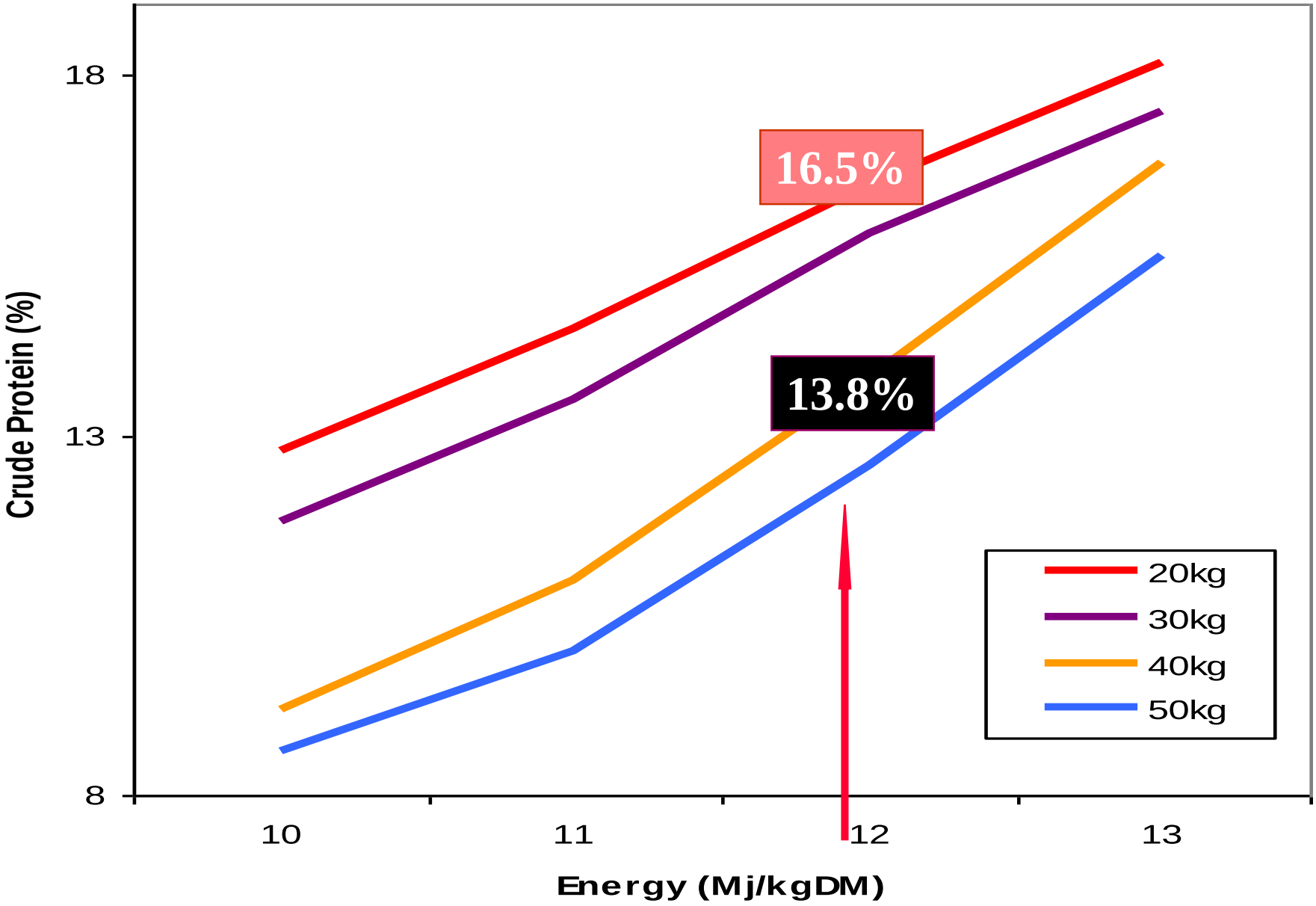
Protein

Protein is needed for muscle development, appetite and wool production

Inadequate protein will lead to a reduction in gut bacteria, digestion slows down and intake drops

Pulses and meals are usually cheaper per unit of protein than cereal grains

Energy and protein should be balanced to achieve optimum growth rates


18
13
8
Crude Protein (%)
16.5%
13.8%
20kg
30kg
40kg
50kg
10
11
12
13
Energy (Mj/kgDM)

Calculating Dry Matter Intakes

DM intakes depends on live weight, feed quality and class of stock.

In general cattle and sheep will consume (as a percentage of their live weight):

- **1.5** to **2%** on dry pasture/poor quality feed
- **2.5** to **3%** on average quality pasture or hay
- **3.5** to **5%** if fed high grain/feedlot rations

Minerals

Cattle and sheep require many minerals - most are needed in only small amounts

Of the major minerals Ca, Na, P and Mg are most important

Mineral analysis of ration/diet components can help to identify potential deficiencies and/or interactions

Calcium

Important for

- nerve function
- muscle contraction
- blood clotting
- activation of a number of enzymes
- bone formation

Cereals, pulses and some meals are low in Ca

Legumes have more calcium than grasses

Calcium

Requirements increase

- if feeding energy-dense rations;
- in late pregnancy and
- early lactation
- high potassium intake

The ewe's ability to absorb and use calcium depends on it's Vitamin D3 status

Calcium

Deficiency symptoms:

- muscle weakness
- paralysis and/or muscle tremors
- “proppy” or staggering gait with head held high
- inability to stand
- sit on brisket with head to flank

Potassium

Important for

- enzyme functions
- muscle contraction
- nerve impulse transmission
- electrolyte, acid/base and water balance

Inhibits Mg absorption in the rumen – often results in a doubling of Mg requirements!

High K diets predispose stock to milk fever and grass tetany

Magnesium

Has a role in

- metabolism of CHO's, lipids & protein
- nerve conduction
- muscle contraction and
- protection against milk fever

High intakes of

- K, Ca, P, N decrease Mg availability
- Na and carbohydrates increase availability

Magnesium

Deficiency symptoms:

- grass tetany,
- mastitis,
- excessive nervous behaviour and
- most of the symptoms seen with calcium deficiency

Effect of mineral supplements on sheep liveweight gains

Livestock	Supplement	Increase in liveweight gain (%)
Sheep	Magnesium	24 to 25
	Sodium	18 to 37
	Magnesium and sodium	31 to 54

Cattle

- 140g/h/d of 2:2:1 Causmag/Salt/ Grain supplement
- 25% increase in ADG

Source: Dove (2018)

Magnesium

Prevention and Treatment:

- 500 g causmag/molasses in 2 litres of water onto hay. Feed treated hay at the rate of 100 sheep per bale.
- Epsom salts (500g per 100 litres) or magnesium chloride (420g per 100 litres) to water
- Causmag etc within the grain ration (0.5-1% w/w)
- Adequate salt
- High fibre and high energy diet
- Minimising stress

My thoughts:

Loose lick year-round

- 2/2/1 Lime/Salt/Causmag
- 2/2/1/1 Lime/Salt/Causmag/Gypsum
- 1/1 Dolomite/Salt
- 1/1 Acid Buf/Salt
- 2/1/1 Acid Buf/Salt/Gypsum

Lime (Ca); Salt (Na); Acid Buf/Dolomite (Ca and Mg); Causmag (Mg); Gypsum (Ca and S)

Vitamin A :

Needed for

- normal bone growth & development,
- regulation of cell growth
- reproduction and
- light transmission to the brain

Produced via conversion of carotene

Stored in liver (fat soluble)

Green pasture/hay, leaves and corn are good sources

10% + loss /month in pellets and premixes after date of manufacture

Vitamin A :

Signs include

- night blindness and/or conjunctivitis/blue haze
- inappetence
- poor coordination, muscular weakness, lameness
- scouring
- urinary calculi

Vitamin E

An antioxidant

Role in maintaining cell membranes

Occasionally seen in weaners which have had no green feed for several months.

Fat soluble (long term storage)

Predisposing Factors:

- feeding hay or grain over extended periods
- high-grain rations with limited or no roughage, especially high-moisture grains
- high fat levels in ration
- lengthy storage of feeds

Vitamin E

Signs and Symptoms:

The fastest growing lambs are the most susceptible

- ‘stiff muscled’ appearance
- animals appear bright and alert but are reluctant to stand
- death through heart failure when stressed

Green feed, oils and grains (unless long term stored) are good Vit E sources

Vitamin D

Formed by the action of sunlight/UV light upon sterols in the skin of animals or in plant tissue

Fat soluble

Increases the absorption and metabolic use of Ca and P; helps regulate blood calcium levels

Signs and Symptoms:

- ill thrift
- stiffness and/or hunched back
- high incidence of bone fractures
- Ricketts

Green hay is a reasonable source.

Vit D metabolism can be inhibited by excessive CHO's

Vitamin B12

Cobalt is converted to B12 in the rumen

Stored in the liver

Needed for

- cell growth,
- energy (glucose production) and
- wool production (metabolisation of methionine)

Rate of absorption (in small intestine) is

- enhanced by slow gut flow
- inhibited if rumen or SI damaged

Deficient animals are unable to metabolise propionic acid into glucose

Resources

- Drought Feeding and Management of Sheep (AWI) https://www.wool.com/globalassets/start/on-farm-research-and-development/sheep-health-welfare-and-productivity/sheep-nutrition/awi-drought-resources/drought-feeding-and-management.pdf
- Feeding and Managing Sheep in Dry Times Bulletin 4697 (DAFWA) http://www.ruralrdc.com.au/WMS/Upload/Resources/FeedManSheep06.pdf
- Feedlotting Lambs Primefact 523 (NSW DPI) http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0020/193313/Feedlotting-lambs.pdf
- Feed Cost Calculator (NSW DPI) http://www.dpi.nsw.gov.au/animals-and-livestock/nutrition/costs-and-nutritive-value/feed-cost-calculator
- Full Hand Feeding of Sheep – Quantities (NSW DPI) http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0016/104641/full-hand-feeding-of-sheep-quantities.pdf
- Lifetime Ewe Program and Phone App http://www.sheepcrc.org.au/education/producer-training/lifetime-ewe-management.php
- Managing Drought (NSW DPI) http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/90329/Managing-drought-2014.pdf
- Managing sheep in drought-lots – A best practice guide (AWI) https://www.wool.com/globalassets/start/on-farm-research-and-development/sheep-health-welfare-and-productivity/sheep-nutrition/awi-drought-resources/gd0458_managing-sheep-in-droughtlots.pdf
- National Procedures and Guidelines for Intensive Sheep and Lamb Feeding Systems http://www.mla.com.au/CustomControls/PaymentGateway/ViewFile.aspx?ftuTEsgMoCWQrzoAknrYopGVl33rCLqbJlux5iBn74DYardBJ7uTc+G/oo+xyaXV3EYMKKAfsht7d1Tnt3BqiA==
- Opportunity and Drought Feedlots – Making It Work (Littler, B) https://cdn.csu.edu.au/__data/assets/pdf_file/0005/1371884/2014-GC-feedlotting-B-Littler.pdf
- Stock Water – A Limited Resource (AWI) https://www.wool.com/globalassets/start/on-farm-research-and-development/sheep-health-welfare-and-productivity/sheep-nutrition/awi-drought-resources/gd0387_stock_water_rnd_final_low-res.pdf
- Supplementary feeding and feed budgeting of sheep https://www.agric.wa.gov.au/feeding-nutrition/supplementary-feeding-and-feed-budgeting-sheep?page=0%2C0#smartpaging_toc_p0_s4_h3
- Sheep CRC Feedlot Calculator http://www.sheepcrc.org.au/resources/psm-software-feedlot-calculator.php

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